

Water Availability and Conservation Report for Indian Wells Valley

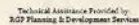
South Lahontan Regional Forum

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Kern County Planning & Community
Development Department



IWV Guiding Characteristics



VISION STATEMENTS

- The Indian Wells Valley of the future should:**
- Support the sustainability of the military mission at China Lake Naval Air Weapons Station
 - Have a heightened awareness of water usage and supply issues and increase water efficiency
 - Have enhanced library services
 - Have a new east-west roadway to supplement SR-178

- Use rural design standards similar to the following where appropriate:
 - Larger lot sizes
 - Rural street standards (limit curb, gutter and sidewalks req.)
 - Septic systems and private wells
 - No or very limited street lighting
- Offer historical preservation options and incentives in Inopolen
- Reduce flood hazards where feasible

- Increase economic activity and development, particularly in the downtown along Main Street and adjacent to the airport
- Improve the connections to east (Death Valley and Las Vegas)
- Expand OHV access to appropriate areas
- Improve availability of medical services for all residents

- Expand public transportation options to adjacent cities
- Provide more services to all age groups
- Increase senior housing opportunities
- Improve bicycle access between Inyokern, China Lake Acres and Ridgecrest
- Enhance pedestrian, bicycle, and equestrian access to public lands to the south and west
- Expand existing or construct new active recreation facilities (parks & ball fields) in the Inyokern and China Lake Acres areas

Vision Implementation
Indian Wells Valley



Kern County Planning and Community
Development Department



Highlights of Today's Presentation

- Work done to date.
- Analysis approach
- Initial findings



Who is Todd Engineers?

- ▶ Todd Engineers, Alameda, CA
 - Consulting firm specializing in groundwater studies.
 - Hired by County of Kern
- ▶ Project Staff
 - Gus Yates, PG, CHG: Senior Hydrologist
 - Iris Priestaf, PhD: President



Objectives

- ▶ Sustainability (County of Kern)
 - Comprehensive review of the groundwater basin.
 - Based on determinations, recommendation of actions available to ensure a long-term sustainable basin and water supply for all residents of the Inyokern area.

- ▶ Study Objectives (Todd Engineers)
 - Status report on groundwater conditions.
 - Develop strategic goals.

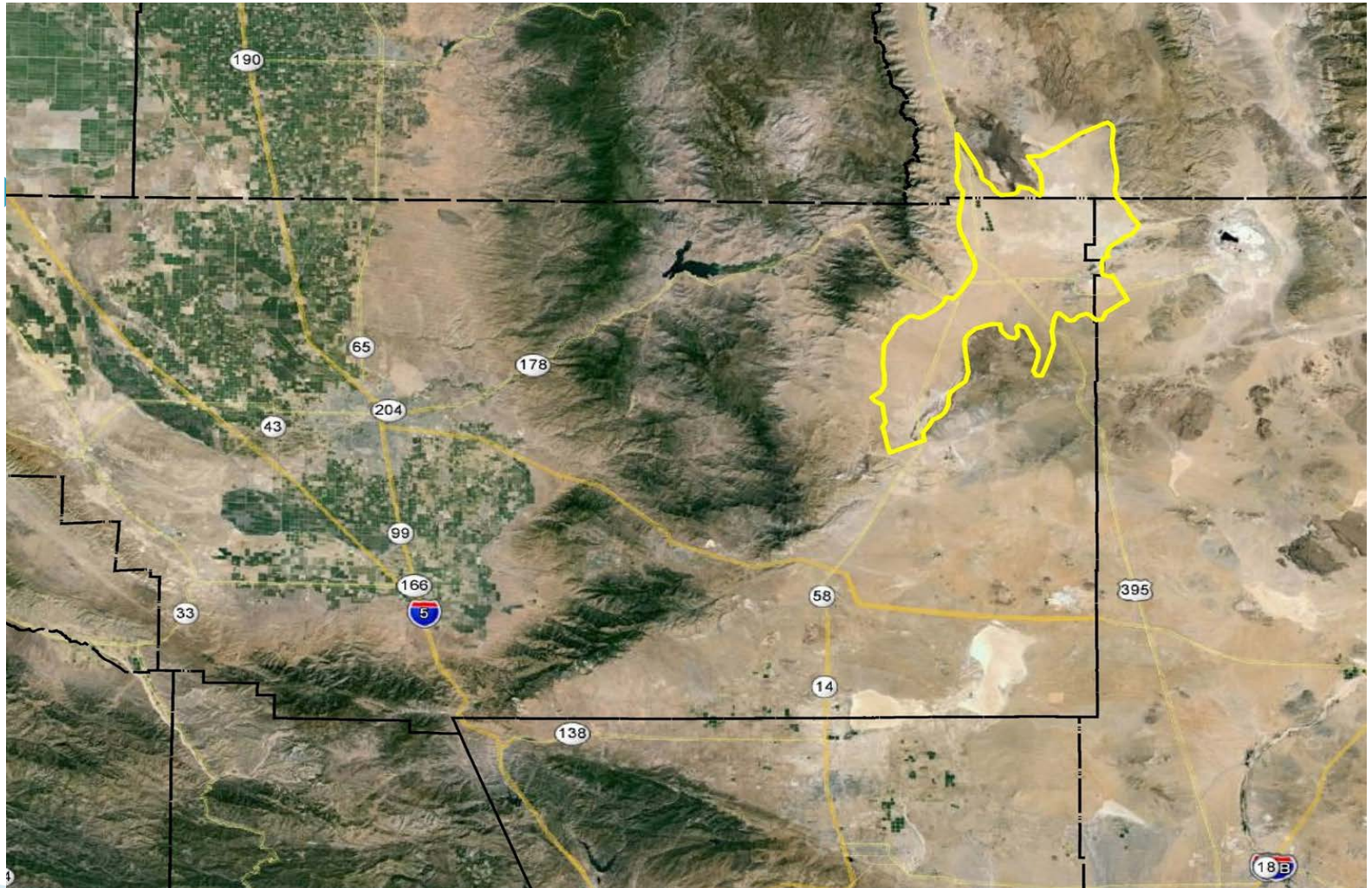


Study Approach

- ▶ Critically review previous studies.
- ▶ Evaluate perceptions, concerns and ideas.
- ▶ Strive for consensus on technical issues.
- ▶ Propose strategic goals.
- ▶ Recommend management measures and identify potential next steps.



Study Area



Key Studies We Reviewed

USGS

Lee (1912, 1913)
Thompson (1929)
Kunkel and Chase (1969)
Bloyd and Robson (1971)
Berenbrock and Martin (1991)

Others

Austin (1988)
Tiedemann (1991)
USBR deep well report (1995)
Dendy (1997)
Ostdick (1997)
Kern County GW ordinance (1998)
Thyne, Gillespie and Ostdick (1999)

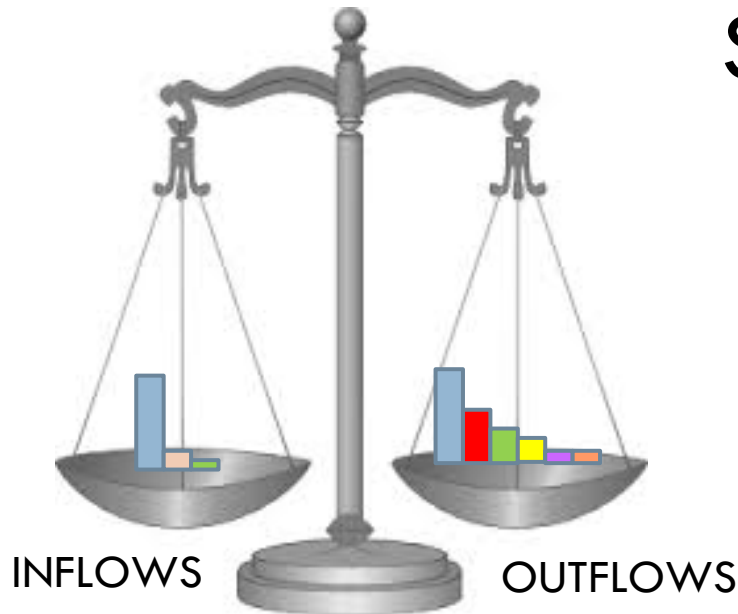
Others (continued)

Tetra Tech (2003)
DWR Bulletin 118 (2004)
GTC (2008)
Brown and Caldwell (2009)
IWVWD UWMP (2010)
WSIP DEIR (2010)
Inyo-Mono IRWMP (2011)
Ridgecrest drainage and WWTP plans
(1989, 2011)
GW Management Plan (2012)
Fremont Valley water project NOP
(2012)
TriEco and Tetra Tech (2012)

And more...

Water Balance is Key to Supply

$$\text{Inflows} - \text{Outflows} = \text{Change in Storage}$$



Water Balance: Predevelopment

$$\text{Inflows} - \text{Outflows} = \text{Change in Storage}$$

- Mountain front recharge
- Inter-basin inflow??

- Playa ET
- Inter-basin outflow? = zero



Water Balance: Developed Basin

$$\text{Inflows} - \text{Outflows} = \text{Change in Storage}$$

- Wastewater & irrigation percolation
- Mountain front recharge
- Inter-basin inflow??

- Wells
- Playa ET
- Inter-basin outflow?



General Discussion

- ▶ Basin is in overdraft.
- ▶ Open-basin hypothesis not supported by available data.



Discussion Points

- ▶ Water levels continue to decline.
- ▶ Declines occur throughout the basin.
- ▶ Inflow from Kern Plateau via deep fractures is hydrogeologically improbable.
- ▶ No explanation for where excess inflow went prior to development.



Discussion Points (Continued)

- ▶ Errors in Thyne et al (1999).
 - Groundwater flux calculations
 - Tritium in deep wells
 - Explanation of water isotopes
- ▶ Downward gradients at China Lake.

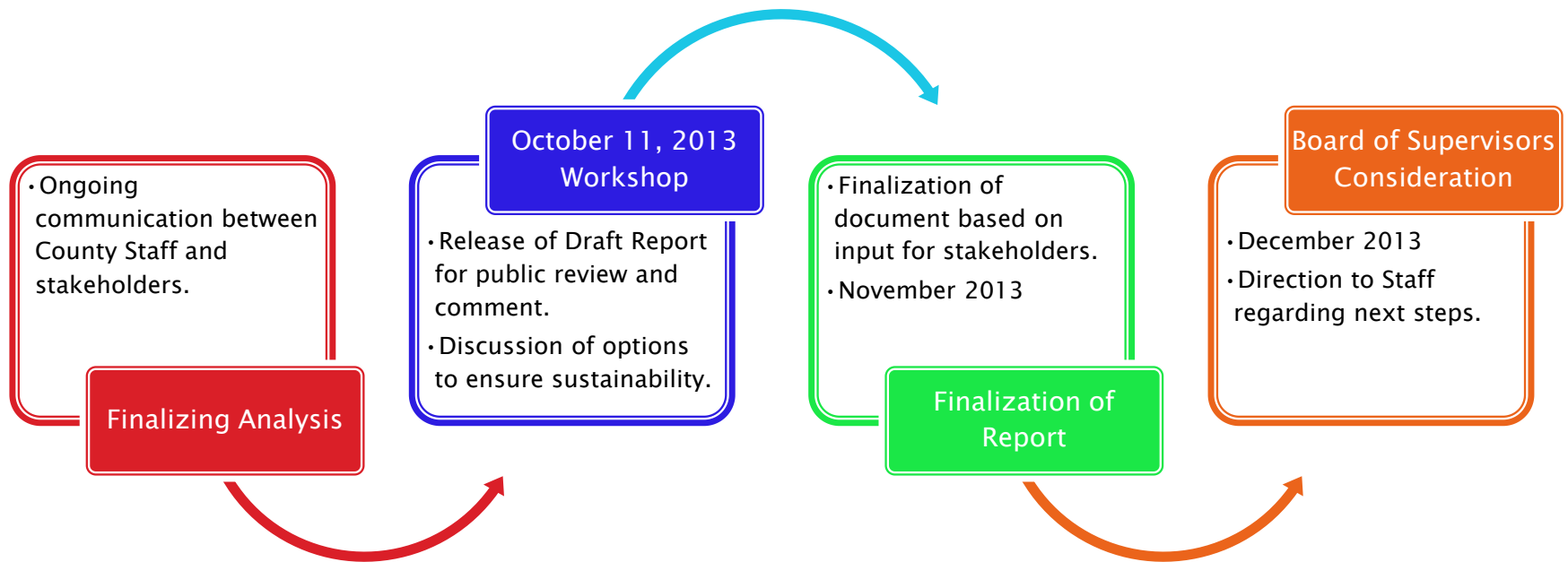


Next Steps

- ▶ Finalize review of all available data.
- ▶ Finalize groundwater findings.
- ▶ Determine and identify potential approaches and recommendations regarding actions to ensure a long term sustainable groundwater basin for the region.
- ▶ Recommend action steps available to Kern County.



Next Steps



Contact & Questions

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